What is claimed is:

[Claim 1] A method for detecting a ligand comprising:

(a) contacting a sample having or suspected of having a ligand with an affinity substrate (inking), wherein the affinity substrate comprises a receptor capable of specifically binding to the ligand;
(b) contacting the affinity substrate with a detection surface (stamping), wherein at least a portion of the ligand which is bound to the receptor is transferred to the detection surface; and
(c) detecting presence of the ligand on the detection surface, wherein the detection surface further comprises a liquid crystal.

[Claim 2] The method according to claim 1, further comprising:

(d) washing the affinity substrate after (a);
(e) washing the detection substrate after (b); or
(f) both (d) and (e).

[Claim 3] The method according to claim 1, wherein the receptor or ligand comprises a biomolecule, a biomolecule recognition agent, a peptide, a polypeptide, a protein, a carbohydrate, a toxin, a metal, a heavy metal, a chelator, a pathogen, a virus, a bacterium, a mammalian cell or part of a mammalian cell, a nucleic acid, a nucleic acid analogs or mimic, a sugar, antibodies or functional fragment thereof, an organic molecule, a lipid, a phospholipid, a drug, a chemical agent, a pesticide, a herbicide, or a fragment thereof.

[Claim 4] The method according to claim 1, wherein the affinity substrate comprises a polymer, a silica material, a metal or a metal oxide.

[Claim 5] The method according to claim 1, wherein the affinity substrate comprises polydimethylsiloxane (PDMS).

[Claim 6] The method according to claim 5, wherein PDMS is further peptide-terminated.

[Claim 7] The method according to claim 6, wherein peptide-terminated PDMS is capable of detecting a phosphorylated peptide.

[Claim 8] The method according to claim 5, wherein PDMS is further antibody-terminated.

[Claim 9] The method according to claim 8, wherein the antibody-terminated PDMS is capable of detecting a protein.

[Claim 10] The method according to claim 1, wherein the receptor is bound to the affinity substrate via one or more linking moieties.

[Claim 11] The method according to claim 1, wherein amount of ligand present in the sample is quantified.

[Claim 12] The method according to claim 1, wherein the affinity substrate comprises an array of receptors located in distinct locations.

[Claim 13] The method according to claim 12, wherein the receptors in the array have specificities for more than one ligand, further wherein the liquid crystal is capable of detecting presence of more than one ligand.

[Claim 14] The method according to claim 12, wherein the receptors in the array are capable of detecting presence of protein phosphorylation at various residues of Epidermal Growth Factor Receptor (EGFR).

[Claim 15] The method according to claim 1, wherein the detection surface comprises a self-assembled monolayer.

[Claim 16] The method according to claim 15, wherein the self-assembled monolayer comprises an amine, alkanethiol or organosulfur compound.

[Claim 17] The method according to claim 15, wherein the self-assembled monolayer is pretreated with an acid prior to (b).

[Claim 18] The method according to claim 1, wherein contacting the affinity substrate with a detection surface is performed on at least a partially curved affinity substrate.

[Claim 19] The method according to claim 1, wherein the detection surface causes homeotropic anchoring in the absence of captured ligand.

[Claim 20] The method according to claim 1, wherein the liquid crystal comprises a nematic liquid crystal, smectic liquid crystal, polymeric liquid crystal, lyotropic liquid crystal, chromonic liquid crystal, frustrated liquid crystals, thermotropic liquid crystal, columnar liquid crystal, nematic discotic liquid crystal, calamitic nematic liquid crystal, ferroelectric liquid crystal, discoid liquid crystal, or cholesteric liquid crystal.

[Claim 21] The method according to claim 1, wherein the liquid crystal is pretreated by illumination with UV light.

[Claim 22] The method according to claim 1, wherein the liquid crystal comprises 4-cyano-4'-pentylbiphenyl (5CB), or doped salt thereof.

[Claim 23] The method according to claim 1, wherein the orientation of the liquid crystal is detected optically or electrically.

[Claim 24] A detection surface comprising a support, a first layer on the support and a self-assembled monolayer on the first layer.

[Claim 25] The detection surface according to claim 24, wherein the self-assembled monolayer comprises an amine, alkanethiol or organosulfur compound.

[Claim 26] The detection surface according to 24, wherein the first layer comprises a metal layer, polymer layer or a silane layer.

[Claim 27] The detection surface according to claim 26, wherein the metal layer comprises gold, silver, copper, platinum, palladium, chromium, titanium or oxides thereof.

[Claim 28] The detection surface according to claim 24, further comprising a liquid crystal on the detection surface.

[Claim 29] The detection surface according to claim 28, wherein the liquid crystal is thermally annealed to the detection substrate.

[Claim 30] A method of orienting a liquid crystal on a surface containing a ligand using microcontact printing or affinity microcontact printing comprising the steps of:

(a) contacting the ligand to a first surface, wherein the ligand is at least in part attached to the first surface; and

(b) contacting the ligand-decorated first surface to a second surface, wherein the ligand is at least in part attached to the second surface; wherein at least a portion of the first surface is partially curved.

[Claim 31] The method according to claim 30, wherein the first surface comprises an affinity substrate having a receptor capable of specifically binding to the ligand.

[Claim 32] The method according to claim 31, wherein the affinity substrate comprises polydimethylsiloxane (PDMS).

[Claim 33] The method according to claim 30, wherein the second surface further comprises a self-assembled monolayer.

[Claim 34] The method according to claim 33, wherein the self-assembled monolayer comprises an amine, an alkanethiol or an organosulfur compound.

[Claim 35] The method according to claim 30, wherein the ligand comprises a biomolecule, a biomolecule recognition agent, a peptide, a protein, a carbohydrate, a toxin, a metal, a heavy metal, a chelator, a pathogen, a virus, a bacterium, a mammalian cell or part thereof, a nucleic acid, a nucleic acid analogs or mimic, a sugar, antibodies or functional fragment thereof, an organic molecule, a lipid, a phospholipid, a drug, a chemical agent, a pesticide, a herbicide, or a fragment thereof.

[Claim 36] The method according to claim 31, wherein the receptor comprises a biomolecule, a biomolecule recognition agent, a peptide, a protein, a carbohydrate, a toxin, a metal, a heavy metal, a chelator, a pathogen, a virus, a bacterium, a mammalian cell or part thereof, a nucleic acid, a nucleic acid analogs or mimic, a sugar, and antibodies or functional fragment thereof, an organic molecule, a drug, a chemical agent, a pesticide, a herbicide, or a fragment thereof.

[Claim 37] A kit for detecting a ligand comprising:

(a) an affinity substrate;
(b) a detection substrate which is separate from the affinity substrate; and
(c) a liquid crystal.

[Claim 38] The kit according to claim 37, further comprising one or more receptors that are specific for a ligand.

[Claim 39] The kit according to claim 37, further comprising a chemical compound that is capable of chemically modifying the detection surface.

[Claim 40] The kit according to claim 39, wherein the chemical modification comprises an amine.

[Claim 41] The kit according to claim 37, wherein the affinity substrate comprises one or more ligands.